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REMARKS

First of all applicants wish to express their gratitude for the courtesies extended to the undersigned attorney during a telephonic interview conducted on March 5, 2008. The Examiner's Interview Summary made of record accurately summarizes the content of that interview. More particularly, during the interview applicants' attorney asserted that Moorman (US 5,356,782) and Fleming (US 6,365,417) failed to teach or suggest an analyte detection device that comprised two separate and distinct reagents present on the device wherein the first reagent interacts with the analyte and the second reagent interacts with the solvent carrying the analyte. Applicants' disclosed device and method allow for the independent measurement of both the overall amount of sample solvent added to the device as well as the overall amount of analyte added to the device. Applicants' attorney noted specific passages in the Moorman and Fleming references that indicated the prior art devices and procedures only allowed for the measurement of the amount of analyte present on the device.

Applicants acknowledge the Examiner's finding that claims 23-31 are allowed, and that claims 19 and 21-38 remain pending in the application. Claim 32 has been amended to further clarify that the control substance produces a photometrically detectable signal, wherein the intensity of the second photometrically detectable signal is a function of the amount of the sample matrix applied to the test field. Support for the amendment to claim 34 is found on page 10, lines 1-6.

Claims 21, 32 and 33 stand rejected as being anticipated by Moorman (US Patent No. 5,356,782). Applicants respectfully traverse this rejection.

Moorman discloses the use of a capillary fill device that comprises a negative control, a positive control and reagents for detecting an analyte. During the March 3rd teleconference, applicants noted that claims 21, 32 and 33 of the present invention require the inclusion of two separate components wherein each of the two components interact with the sample to produce a detectable signal. In particular, applicant's invention requires a first reagent that interacts with the analyte present in the sample to cause a first photometrically detectable signal to be produced. A second reagent ("a control substance") is also present in the test field, wherein the control substance interacts with a sample matrix of the sample to cause a second photometrically

detectable signal to be produced. The first photometrically detectable signal is produced in proportion to the amount of analyte present, whereas the second photometrically detectable signal is produced in proportion to the amount of sample matrix (e.g., amount of solvent) present.

Moorman only discloses the inclusion of one reagent that interacts with the sample, and that reagent only indicates the amount of analyte placed on the sample. The device and method disclosed by Moorman fails to teach or suggest the inclusion of a second component that interacts with the sample to produce a signal indicative of the total amount of liquid added to the test device. The Examiner notes that Moorman discloses the addition of a second component (i.e., the negative control), but applicants respectfully submit that the negative control is not an equivalent element to the required "control substance" of the present invention since it performs an entirely different function.

Applicant's method relies on the presence of two entities each of which produces a signal based upon an interaction with a different component of the applied sample. As stated by Moorman at column 8, lines 3-5 the negative control is a marker for the integrity of the test system and the negative control "should never present a signal". Accordingly, Moorman fails to teach a device that comprises a reagent that interacts with the analyte in the sample to produce a first photometrically detectable signal as well as a second reagent (i.e., the control substance) that interacts with the sample matrix to produce a second photometrically detectable signal.

Unlike Moorman, where the negative control is present to confirm the integrity of the system, the "control substance" of the present invention always produces a signal, wherein the intensity of the signal indicates how much total sample matrix has been added to the device. Moorman fails to teach or suggest the inclusion of a component that measures the overall sample volume that was added to the device.

The Examiner also makes note that the Moorman device can include a "plurality of zones" where color reactions in the zones will represent a semiquantitative measure of the analyte concentration (column 14, lines 60- column 15, line 14). However, each of the "plurality of zones" contains a measured amount of the same analyte interacting reagent, such that as the sample moves across the zones the analyte present in the sample becomes depleted and thus the last zone producing a reaction provides an indication of the total amount of analyte that was

present in the original applied sample. This embodiment fails to disclose a testing device that comprises two separate and distinct reagents that each interact with a different component of the sample to produce a first and second photometrically detectable signal.

The Moorman device simply does not contain two separate reactive agents that each interact with different components of the sample (i.e., the sample analyte and the sample matrix) to produce photometrically detectable signals that are proportional to the amount of sample analyte and the sample matrix present on the device. On page 7 of the December 3, 2007 Office Action, the Examiner states that applicants are arguing limitations not found in the present claims when applicants make reference to the presence of two separate reactive agents in the claimed device. In response, applicants note that claim 21 requires both a "control substance" and a "reagent" disposed on the test element. These two elements (the "control substance" and the "reagent") represent the two separate reactive agents that are not disclosed in the prior art device. Therefore, applicants submit the referenced limitation of two separate reactive agents is positively recited as part of the claimed invention.

The Examiner has also stated with regards to claims 32 and 33 that a recitation of intended use of a claimed device must result in a structural difference between the claimed invention and the prior art to patentably distinguish the claimed invention over the prior art. Applicants again assert that there is an additional element present in the device of claims 32 and 33 that is not present in the devices disclosed by the prior art. That additional element is the "control substance", which applicants have further delineated by making reference to the function of that element: "the control substance being capable of interacting with a sample matrix of the sample, wherein (i) the interaction between the control substance and the sample matrix causes a second photometrically detectable signal to be produced when the test field is illuminated with light and (ii) the intensity of the second photometrically detectable signal is a function of the amount of the sample matrix applied to the test field." Moorman simply fails to teach or suggest the inclusion of such an element in their device. Nor is there any suggestion in any of the references for all their combined teachings that would motivate one to include both reactive elements on a single test device, wherein the two reactive elements produce a first and second photometrically detectable signal, respectively, indicative of the total analyte present as well as the total volume of the sample.

Applicants respectfully submit that Moorman fails to teach the present of a "control substance" and therefore fails to teach all the elements of the presently claimed invention. Accordingly, applicants respectfully request the withdrawal of the rejection of claims 21, 32 and 33 for anticipation over Moorman.

Claims 32, 33 and 35 stand rejected as being anticipated by Fleming et al (US Patent No. 6,365,417). Applicants respectfully traverse this rejection.

The Examiner contends that Fleming et al discloses the use of fluorescein as a control agent in the test field, making reference to column 7, lines 7-8. However, applicants note that Fleming only discloses fluorescein as a label, and not as a control substance for determining the volume of sample added to the device. There is simply no appreciation in Fleming that fluorescein could be used other than as a standard labeling reagent. Therefore, there is no motivation for using fluorescein in any other manner than as a label. In this regard, Fleming has defined a label as being a "molecule or composition bound to an analyte, analyte analog or binding partner that produces a signal" (column 6, lines 64-65), wherein an analyte is defined as a "compound ... to be measured" (column 6, lines 35-37). In this context, as defined by Fleming, the signal produced by the "label" is always correlated with the analyte concentration (e.g., unbound label will be removed) and thus the label cannot also produce a signal that correlates to the amount of sample matrix present on the device. Accordingly, Fleming only discloses one element that produces a photometrically detectable signal (i.e., the labeled analyte detecting reagent). Furthermore, consistent with the disclosure of Fleming one would not be motivated to include fluorescein on the device in addition to a separate reagent that is used to detect the analyte, because Fleming fails to disclose any other use for fluorescein than as a simple labeling reagent for detecting analyte concentration.

Applicants claimed device differs in structure from that of Fleming by the requirement of two separate reagents that each produce photometrically detectable signals. Fleming fails to teach or suggest a device that includes two separate reagents that interact with the sample to produce a first and second photometrically detectable signal, where the first and second photometrically detectable signals are correlated with the amount of analyte and sample matrix, respectively, present on the device.

In addition to the labeled reagent for detecting the analyte, Fleming also discloses an embodiment wherein a "soluble sample adequacy indicator" (such as a dye) is also present on the device. This sample adequacy indicator is included to help assure that an adequate amount of liquid has been placed on the device. However, applicants respectfully submit that the adequacy indicator dye is not the equivalent of the required control agent of applicants' claimed invention.

Independent claim 32 and dependent claims 33 and 35 all require the presence of a control substance (in addition to a separate reagent that interacts with the sample analyte) wherein the control substance interacts with the sample matrix of the sample to produce photometrically detectable signal, the intensity of which is a function of the amount of the sample matrix applied to the test field. The indicator dye disclosed in Fleming is incapable of producing such a signal, and therefore applicants respectfully submit that Fleming fails to teach or suggest one of the elements of applicants' claimed device.

In Fleming, the location of a passive dye indicates whether the device has been sufficiently loaded. Accordingly, the Fleming device is incapable of indicating to what extent the device is underdosed, it is only capable of indicating that the device is "full" or "not full". Fleming fails to teach or suggest the inclusion of a first reagent that interacts with the sample to produce a first photometrically detectable signal **and** a second reagent that interacts with the sample matrix to produce a second photometrically detectable signal, wherein the first and second photometrically detectable signals indicates the amount of sample analyte and sample matrix present, respectively. Fleming only discloses the generation of a photometrically detectable signal in the context of a label that is used to detect the analyte. Fleming is devoid of any suggestion that first reagent for detecting the presence of an analyte could be used in conjunction with a second reagent (i.e., the control element), wherein the second reagent interacts with the sample matrix to produce a second signal that is proportional to the amount of sample matrix present. Accordingly, Fleming fails to anticipate the present invention due to the failure to teach a device that has the two specified elements (i.e., the reagent and the control element) of the presently claimed invention. The invention of claims 32, 33 and 35 is believed to be patentably distinct from the device disclosed in Fleming and applicants respectfully request the withdrawal of the rejection of those claims as obvious over the disclosure of Fleming.

US App. No. 10/686,970
Response to 12/3/07 Office Action

Claims 19, 22 and 38 stand rejected under 35 USC 103 as being unpatentable over the teachings of by Moorman (US Patent No. 5,356,782) in view of Yamamoto (US 4,666,578). Applicants respectfully traverse this rejection.

The inadequacies of the disclosure of Moorman with regards to the invention of claims 21, 32 and 33 has been discussed immediately above. The secondary Yamamoto fails to supplement the inadequacies of the Moorman teaching with regard to the present invention. Yamamoto discloses a method of calculating the concentration of an unknown amount of total protein relative to a known protein standard through the use of an electrophoretic image. As noted by the Examiner, the reference also discloses a method measuring the total protein present in each sample after it is applied to the device as a means of detecting and correcting for small discrepancies in the amount of sample applied. Yamamoto provides a formula for compensating for the different amounts of total protein present in the respective loaded samples and thus allows for the normalization of the data between samples. In other words Yamamota provides a method for measuring total protein present in multiple samples, by electrophoretic imaging, to allow for normalizing the data between multiple samples. The reference is devoid of any mechanism to determine the relative volume of each sample added to the device, it is only capable of detecting protein and not the sample matrix (e.g., the solvent).

The present invention is directed to the detection and correction of underloaded test strips. Accordingly, applicants' "control substance" does not detect a protein present in the sample, but rather the control substance interacts with the sample matrix (e.g., the solvent) to indicate the total volume of the sample that has been added to the device. Yamamota, similar to Moorman, fails to teach or suggest a method of determining the amount of sample matrix (e.g., sample solvent) added to a test device, wherein a control substance present on the device (in addition to a reagent which interacts with the analyte) produces a photometrically detectable signal that is directly proportional to the amount of sample matrix added to the device.

The Yamamoto and Moorman references for all their combined teachings fail to teach or suggest a device that comprises two separate reagents that react with different components (i.e., the analyte and the sample matrix) present in the sample to produce photometrically detectable signals that are indicative of the amounts of the respective sample components placed in contact with the device. Accordingly, applicants respectfully submit that claims 19, 22 and 38 are

patentable over the teachings of Moorman (US 5,356,782) in view of Yamamoto (US 4,666,578) and applicants respectfully request the withdrawal of the rejection based on those references.

Claim 34 stands rejected as being unpatentable over the teachings of Moorman (US 5,356,782) in view of Carr et al. Applicants respectfully traverse that rejection.

The deficiencies of the disclosure of Moorman with regards to the invention of claims 21, 32 and 33 has been discussed above. The secondary Carr reference fails to supplement the missing teachings of Moorman with regards to the invention of claim 32 from which claim 34 depends. As noted by the Examiner, Carr discloses that chromophores can be used as labels for "quantification of the products of a synthesis..." including the concentration of a substrate molecule (see page 7, lines 23-30). However, the reference is devoid of any suggestion that a chromophore could be used to quantitate the total amount (volume) of liquid that is placed on a test element. Accordingly, both the Moorman and Carr reference fail to teach or suggest the present invention which includes two separate reactive agents, one for detecting the amount of analyte present and the second for detecting the amount of sample matrix (e.g., solvent) present. Accordingly, claim 34 is believed to be patentable over the teaching of Moorman in view of Carr and applicants respectfully request the withdrawal of that rejection.

Claim 35 stands rejected under 35 USC 103 as being obvious over Moorman in view of Caspers et al. Applicants respectfully traverse this rejection.

The deficiencies of the Moorman disclosure regarding its failure to teach a device that is capable of independently measuring both the volume of sample added to the device as well as the amount of analyte present has been discussed above. The secondary Caspers reference fails to supplement the inadequacies of the Moorman. As noted by the Examiner Caspers discloses that a fluorescein dye solution can be used as a low-loss signal coupler in conjunction with fiber optics. The reference while noting that fluorescein can be detected at very low concentrations, fails to suggest that it could be used as a control substance to determine the amount of sample that is placed in contact with the control substance. Accordingly, the reference is devoid of any suggestion that fluorescein could be used to quantitate the amount (volume) of liquid that is placed on a test element. Therefore, the Caspers reference fails to supplement the inadequacies

of the Moorman teaching with regards to the present invention. Claim 35 is believed to be patentable over the teaching of Moorman in view of Caspers and applicants respectfully request the withdrawal of that rejection.

Claim 36 stands rejected under 35 USC 103 as being obvious over Moorman in view of Mach et al. Applicants respectfully traverse this rejection.

The deficiencies of the Moorman disclosure regarding its failure to teach a device that is capable of independently measuring both the volume of sample added to the device as well as the amount of analyte present has been discussed above. The secondary Mach reference fails to supplement the inadequacies of the Moorman. Mach discloses that a chlorophenol red dye solution can be used to determine the presence of bacteria. Applicants do not contend that chlorophenol red is a novel dye, but rather that applicants are the first to use this compound in combination with the claimed system and method to measure the amount of liquid added to a test element. Mach is simply devoid of any suggestion that chlorophenol red could be used to quantitate the amount (volume) of liquid that is placed on a test element. Therefore, the Mach reference fails to supplement the inadequacies of the Moorman teaching with regards to the present invention. Claim 36 is believed to be patentable over the teaching of Moorman in view of Mach and applicants respectfully request the withdrawal of that rejection.

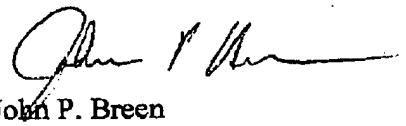
Claim 37 stands rejected under 35 USC 103 as being obvious over Moorman in view of Mach et al., as applied to claim 36 and further in view of applicants' admitted prior art on page 15 of the specification. Applicants respectfully traverse this rejection.

The deficiencies of the Moorman disclosure regarding its failure to teach a device that is capable of independently measuring both the volume of sample added to the device as well as the amount of analyte present has been discussed above. The secondary Mach reference fails to supplement the inadequacies of the Moorman. As described above the mere fact that various dyes have been previously disclosed as being useful as labeling reagents does not teach or suggest that such dyes could be used to quantitate the volume of a solution. Applicants do not contend that phosphomolybdic acid is a novel compound. However, applicants are the first to use this compound in combination with the claimed system and method to measure the amount

of liquid added to the test element. Mach is simply devoid of any suggestion that phosphomolybdic acid could be used to quantitate the amount (volume) of liquid that is placed on a test element. Therefore, the Mach reference fails to supplement the inadequacies of the Moorman teaching with regards to the present invention. Claim 37 is believed to be patentable over the teaching of Moorman in view of Mach and applicants respectfully request the withdrawal of that rejection.

Applicants believe the claimed invention is patentably distinct from the cited references and respectfully request allowance of the claims, and passage of the application to issuance. If any further discussion of this matter would speed prosecution of this application, the Examiner is invited to call the undersigned at (434) 220-2866.

Respectfully presented,



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